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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,323	10/29/2004	Khaliq Ahmed	0446-0170PUS1	8341
2292 7590 04/08/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
CREPEAU, JONATHAN				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
04/08/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

### Office Action Summary

**Application No.**

10/506,323

**Applicant(s)**

AHMED ET AL.

**Examiner**

Jonathan Crepeau

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 10-15 is/are pending in the application.
- 4a) Of the above claim(s) 3, 5, 14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6-8 and 10-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-8 and 10-15. Claims 3, 4, 14, and 15 remain withdrawn from consideration. The rejection over JP 9-073913 is withdrawn. However, all the claims are subject to new grounds of rejection under 35 USC 102 and 103 herein. As these rejections were not necessitated by amendment, this action is non-final.

### ***Claim Rejections - 35 USC § 102***

2. Claims 1, 2, 4, 6-8, and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 5-067472. In the abstract, the reference teaches a solid oxide fuel cell comprising an electrolyte, an inner anode layer (1) and an outer anode layer (2) having a hydrocarbon reforming function. The inner layer comprises nickel and yttria-stabilized zirconia and the outer layer comprises a nickel reforming catalyst and a "basic aggregate" material. The latter component functions to alleviate carbon deposition on the electrode during reforming (see abstract). Regarding claims 1 and 6, the component for alleviating carbon deposition can be  $\text{MgO} \cdot \text{ZrO}_2$  (see [0013], Tables 1 and 2 of machine translation). Regarding claim 1, the presence of  $\text{ZrO}_2$  would render the reforming layer a "nickel-zirconia cermet," as claimed. Regarding claim 4, the hydrocarbon reforming layer entirely covers the inner anode layer (see Fig. 1). Regarding claims 7 and 8, it is disclosed that the Ni is present in the reforming layer in an amount of 35-60 vol %. Thus, the component (e.g.,  $\text{MgO} \cdot \text{ZrO}_2$ ) would be present in an amount of 40-65 vol%, which is

considered to be anticipatory of the claimed weight percentage of 1-60 wt%. Regarding claim 10, the cell is an electrolyte-supported cell and the thickness of the reforming layer is 50 microns (see [0022]). Regarding claims 11 and 12, each layer has a porosity of 20-30% (see [0022]).

Thus, the instant claims are anticipated.

### *Claim Rejections - 35 USC § 103*

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 5-067472 in view of JP 9-073913.

JP '472 is applied to claims 1, 2, 4, 6-8, and 10-12 for the reasons stated above.

However, the reference does not expressly teach that a porous conducting layer is provided over the hydrocarbon reforming layer, as recited in claim 13.

In the abstract, JP '913 teaches a solid oxide fuel cell comprising an electrolyte (3), an inner anode layer (2) and an outer anode layer (2') having a hydrocarbon reforming function. The inner layer comprises nickel oxide and yttria-stabilized zirconia and the outer layer comprises nickel oxide and  $\text{MgAl}_2\text{O}_4$ . A porous ionically conductive layer (base tube 1) comprising NiO/CSZ overlies the hydrocarbon reforming layer (see [0009]).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because it would have been obvious to use the conductive base tube material of JP '913 in the fuel cell of JP '472, thereby providing the tube layer "over" the hydrocarbon reforming layer. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods

with no change in their respective functions and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Furthermore, JP '472 also discloses a base tube in the "Description of the prior art" section in [0002]. Accordingly, it would have been obvious to use the conductive base tube material of JP '913 in the fuel cell of JP '472, thereby forming the tube layer in a position over the hydrocarbon reforming layer.

#### ***Response to Arguments***

4. Applicant's arguments filed February 10, 2009 have been fully considered but they are not persuasive. Applicant urges that the JP '472 reference does not teach or suggest using YSZ in the hydrocarbon reforming layer. Without expressly addressing the merits of this argument, upon further review of the reference, the position is taken that the reference is in fact anticipatory of claim 1 as amended. As noted above, the presence of  $\text{MgO} \cdot \text{ZrO}_2$  in the reforming layer renders this layer a "nickel-zirconia cermet" as claimed.

#### ***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the

organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
April 6, 2009